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DSIS ONLY

INTERIM REPORT

14 SEPTEMBRE 1993

THE DEFENCE SCIENTIFIC INFORMATION SERVICES

ITS FUTURE DIRECTION

By: Pierre-St-Onge, DREV
Head/Strategic Planning
and Program Coordination
Susan McIntyre, DREO
Head/Information Services
André Morency, DREV
Assistant Chief

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TABLE OF CONTENTS

EXECUTIVE SUMMARY 4

PART I: THE SITUATION 8

1.0 INTRODUCTION 8

2.0 PORTRAIT OF DSIS 10
- 2.1 HISTORY OF DSIS 10
- 2.2 MANDATE 13
  - 2.2.1 Canadian Forces Administrative Orders. 13
  - 2.2.2 Treasury Board Directives 13
  - 2.2.3 DND recognizes the Importance of sound Information management 14
- 2.3 DSIS - ITS SERVICES, STRUCTURE AND OPERATIONS .. 14
  - 2.3.1 DSIS Services. 14
  - 2.3.2 Collection Management. 15
    - 2.3.2.1 The Collection. 15
    - 2.3.2.2 Distribution and Lending. 17
    - 2.3.2.3 Origin of Distributed Documents. 18
    - 2.3.2.4 Document Requests By and From DSIS. 19
    - 2.3.2.5 Collection Announcement. 20
  - 2.3.3 Selective Dissemination of Information (SDI) 21
  - 2.3.4 Literature Searches 24
- 2.4 DSIS, ITS COSTS COMPARED TO ALLIED NATIONS 24
- 2.5 DSIS ORGANIZATIONAL STRUCTURE 25
- 2.6 DSIS ACTIVITIES 27
- 2.7 DSIS OPERATIONS (related activities by section) 29

PART II: ANALYSIS AND RECOMMENDATIONS 33

3.0 SHOULD DSIS BE DISSOLVED? 33
- 3.1 INTRINSIC VALUE OF INFORMATION 33
- 3.2 UNIQUENESS OF THE ORGANIZATION, ITS MANDATE AND ITS COLLECTION 34
- 3.3 RETURNS ON INVESTMENTS 35
  - 3.3.1 Increased Productivity and Effectiveness of Scientists. 35

3.3.2 Increased Productivity and Effectiveness of Managers. 37
3.3.3 International Ethical and Security Considerations. . 39
4.0 CAN DSIS SERVICES BE REDUCED? 40
5.0 CAN DSIS PROVIDE THE SAME SERVICES WITH FEWER HUMAN RESOURCES? 42
6.0 COULD DSIS OPERATIONS BE IMPROVED? 45

7.0 OTHER ALTERNATIVES 50
7.1 SHOULD DSIS LIMIT ITS SERVICES TO CRAD CUSTOMERS ONLY? 50
7.2 WOULD A DECENTRALIZED COLLECTION AMONG THE DREs BE A VIABLE SOLUTION? 51
7.3 SHOULD DSIS IMPLEMENT A COST-RECOVERY SYSTEM? 52
7.4 SHOULD DSIS OPERATIONS BE TRANSFERRED TO THE CANADA INSTITUTE FOR SCIENTIFIC AND TECHNICAL INFORMATION (CISTI) AT THE NATIONAL RESEARCH COUNCIL? 55
7.5 COULD DSIS DEAL DIRECTLY WITH DTIC? 58

8.0 BIBLIOGRAPHY/REFERENCES 59

EXECUTIVE SUMMARY

In May 1993, Associate CRAD created an ad-hoc committee to produce recommendations on the future of the Directorate of Defence Scientific Information Services (DSIS). The Committee first gathered data on the organization through interviews with the DSIS staff and customers, analyzed existing studies and surveys, scrutinized services and activities, scanned the organization's history and searched the literature to learn more about the situation in allied countries. The Committee also contacted a representative from Health and Welfare Canada to discuss cost-recovery systems and a representative from the Canada Institute for Scientific and Technical Information (CISTI) at the National Research Council to look into the possibility of transferring DSIS to that organization. Part I of this report details that research.

Subsequently, the Committee analyzed the data and drew recommendations as responses to the specific questions that had to be answered about the DSIS mandate. The analysis and recommendations are reported in Part II.

Under Treasury Board (TB) directives, government institutions are responsible for properly managing their information holdings and making them as widely available as possible. DND, through CFAO 57-11, vests the responsibility for scientific defence-related information solely in DSIS. DSIS provides information services to the whole DND community. CRAD staff, by comprising 30% of DSIS's customers, is the largest user group. The DSIS collection is not duplicated elsewhere and is therefore unique.

Created in 1947 under the Defence Research Board, DSIS underwent many reviews and since 1974, 70% of its staff (74 to 25) was cut. Many important services were either transferred to other organizations or simply abandoned. The services that are left are now at the minimum level and all directly relate to managing the collection and making it available to Canadians and allied countries.

Because of problems encountered in the exchange of documents, negotiations were held in the 1960s with the U.S. which led to the current DSIS mandate of serving as the official Canadian defence-related documentation clearinghouse.

The organizational structure of DSIS clearly corresponds to that of a larger organization and should be reviewed. The staff are efficient,

dedicated, believe strongly in the value of their product, and provide services that are much appreciated by all the customers who were interviewed. State-of-the-art equipment and some restructuring could allow further minimal person year reductions to be feasible.

Canada is one of many members of a network of countries and organizations operating with central defence-related documentation management centres. They are found in the U.S., the U.K., France, Germany, the Netherlands, Australia, Portugal, Turkey, NASA, and SHAPE. Presently, DSIS acts as the chairperson of a committee grouping most of these countries and organizations. Whereas figures demonstrate clearly that Canada requests and obtains many times more documents than it provides to allied countries, its investment in DSIS services is even lower than that of the Netherlands.

DSIS annual O&M, capital, and salary costs amount to approximately 1.5M. By providing access to the ADA collection (U.S. unclassified, unlimited defence documents), DSIS saves the Department at least 500K each year. The feedback obtained from customers and which was supported in the Frank report undoubtedly demonstrates the increased productivity of all scientists and managers using DSIS services and indicates that a significant amount of expenditure is saved in avoiding costly duplications of research programs, trials, experiments and mistakes. These savings by very far encompass the investments made by DND in the DSIS organization.

The Committee makes the following recommendations:

1. For historical, legal, security, ethical, international and economic reasons, and taking into account the increased productivity of scientists and managers, who are given access to central information services, the Committee reaffirms the paramount value of the DSIS role and recommends that it be kept intact.

2. No further cuts be made to the services provided by DSIS.

3. The person year reductions be limited to 2 and that they be made subsequent to an immediate structural reorganization that would reduce the layers of supervision.

4. The following improvements be studied by DSIS and implemented without undue delays:

a. Expansion of the use and distribution of the CD-ROM version of the DSIS database and the acquisition of the equipment to produce it,

b. Acquisition of computerized imaging equipment for the reproduction of documents,

c. Use of electronic documents as soon as the DREnet permits,

d. Use of DREnet and other DND networks in support of basic activities such as external access to the DSIS database, modification of SDI (Selective Dissemination of Information) profiles, SDI distribution, and document ordering,

e. Acquisition of the DROLS CD-ROM by the Defence Research Establishment libraries,

f. Review of cataloguing procedures,

g. Request that DSIS become a permanent member of the Information Management Committee, and of the Information Holdings Steering Group, and

h. Production of a video on DSIS services to be included in the ADM(Mat) orientation course and presented on a regular basis to current and potential customers,

5. DSIS continue to provide services to the whole DND community and not limit them to CRAD.

6. A decentralized collection among the DREs be considered as a possible improvement to widen the DSIS collection but not as a solution to the current resources reduction problem.

7. The Committee does not recommend the implementation of a cost-recovery system except for contractors and public customers, according to the provisions of CFP-B-GS-055-00/AG-001.

8. The feasibility of the transfer of DSIS to the National Research Council has been established through a preliminary meeting. It is recommended that a joint committee be set up as soon as possible to further study this alternative. The study would use the NRC methodology and take into account the possible drawbacks

mentioned in this report. It is also recommended that the subject be brought up to the Information Management Committee prior to making any decision and that all other recommendations be actioned without awaiting the results of the NRC study, and

9. Immediate steps be taken to eliminate the CDLS(W) involvement in the processing of documents and requests sent to or received from DTIC. Only the mail function should be kept.

PART I: THE SITUATION

1.0 INTRODUCTION

In mid-May 1993, within the scope of the on-going study of all support services throughout the Chief, Research and Development Branch (CRAD), Associate CRAD set up an ad-hoc committee under the chairmanship of Mr. André Morency, the Assistant Chief of Defence Research Establishment Valcartier (DREV), to make recommendations on the future direction of the Director Defence Scientific Information Services (DSIS). This Committee was also composed of two other members, Mr. Pierre St-Onge, DREV's Head of Strategic Planning and Program Coordination and Ms. Susan McIntyre, the Head of Information Services at Defence Research Establishment Ottawa.

Draft terms of reference and a work schedule were sent to Associate CRAD for review and comments on 14 May. On 25 May, the final versions (see Annex A) were approved and a preliminary report was submitted at the Research and Development Executive Committee (RDEC) Meeting held on 16 June 1993 (Annex B).

A four-step methodology was developed and followed to ensure a sound and valuable evaluation of DSIS responsibilities and services that would take into account all strategic and operational factors such as costs, customers, partners (other organizations and countries involved in the provision of services), security, performance criteria, and any other relevant issues.

The first step consisted in identifying the main services and related activities provided by DSIS, their costs, structure, procedures, constraints, customers and partners. This information was collected through interviews with DSIS staff completed during the first week of June.

The second step, a thorough evaluation of these services and activities, was based on interviews with the DSIS staff, customers and partners, on previous studies and on a literature search. It was completed at the beginning of July. Each service or main activity was evaluated according to the following criteria: a) whether it was considered essential or desirable; b) whether it could or could not be reduced, the minimum operational level of service and resources, the resulting impacts on DSIS, customers, partners, and any constraints; c) whether it could be obtained from other sources and if so, as a whole or in part, at what

cost, with what impact on DSIS, its customers and partners and any constraints. Step two completed the data gathering phase.

In Step 3, during the second week of July, the information obtained during the two previous steps was consolidated and the expected impact was summarized. Finally, during the last week of July, in Step 4, based on the information gathered in Steps 1 and 2 and on the analysis made in Step 3, this final report was produced.

Chapter 2 gives a brief history of the DSIS organization, specifies its mandate, describes its structure, identifies the services it provides, their related activities, costs, and the customers and partners involved in the provision of these services.

Chapters 3-7 provide an evaluation of the information itself and assess the returns on investment. They also identify the impacts of possible cuts, reductions or transfers on customers, partners, performance and operations. They suggest possible improvements and the study of other alternatives. Finally, they contain the Committee's final recommendations on each service and on the future of DSIS, its structure and overall mandate.

2.0 PORTRAIT OF DSIS

2.1 HISTORY OF DSIS (References A to F)

Over the years, DSIS has undergone a number of organizational changes and reviews. Although the goals have varied little from the beginning, the functions and staffing levels have been gradually reduced. Currently, the core functions of DSIS remain with little superfluousness.

When the Defence Research Board was created in 1947, the predecessor of DSIS, the Scientific Intelligence Division was established as one of six scientific divisions. According to Goodspeed, its functions were to:

"collect, collate, and disseminate scientific intelligence and information to meet the needs of the Defence Research Board in the Department of National Defence. This division was also made responsible for all aspects of scientific security and for the clearance of scientific papers as well as for liaison on matters of scientific intelligence with the United States and the United Kingdom. A Scientific Information Centre was set up and over three thousand documents were taken over from the Canadian Army Operational Research Group. The library of the Joint Committee on Enemy Science and Technology also functioned as a part of the Scientific Information Centre, insofar as control and unification of procedure were concerned." (Goodspeed: 1958)

In October 1952, as part of a reorganization, the Defence Scientific Information Service was established as a directorate in the new "Division C." It replaced the Scientific Information Centre. Mr. L.F. MacRae, a librarian, was appointed as the director and he recruited several professional librarians. Another reorganization in the spring of 1955 placed the directorate in the Scientific Staff Branch.

For a number of years, the Service grew and responded to the information needs of the defence science community. DSIS had a research and development (R&D) capability of its own, was involved in the creation of better information systems and was concerned with the advancement of information science and technology. As a result, it was considered necessary to staff it with scientists and engineers who both knew the defence research program and could work on the development of information systems.

By 1965, due to problems with uncoordinated exchange of documents, DSIS was becoming the clearinghouse for exchanges of documents with the U.S. At the initiative of the Defence Research Board, Alice Ironside, an information scientist with DSIS, was sent on assignment to the U.S. Defense Documentation Centre (DDC) to work out arrangements for better exchange procedures. In 1972 she stated that:

> *"The formal acquisition of defence R&D documents for the Department of National Defence, and those working on its behalf, had been centralized in DSIS as described in CFAO 97-11 [sic] dated 26 July 1968. This resulted from U.S. pressure to eliminate duplication of requests by different branches of DND. It is of greater benefit to Canada to receive new documents than to receive notification that documents have been released previously." (Ironside: 1972)*

In April 1974, it was announced that the Defence Research Board would be integrated into the Department of National Defence as the Research and Development Branch. This had a significant impact on DSIS. At the time of integration, they were staffed with 74 positions. As a result of the integration, the Books and Periodicals Library was transferred to the National Defence Headquarters Library and the printing functions of the Scientific Report Publishing Centre were transferred to the Directorate Documentation and Drawing Services (DDDS). This resulted in a reduction of over 20 positions.

A reorganization created two divisions: Scientific Information Resources and Information Processing. The changes reduced the breadth of information services but maintained the R&D components.

Program reviews were performed in 1974 and 1975. During the second review, it became evident that the integration into the Department was a significant turning point for DSIS. It was described as a "very critical personnel situation." Staffing was suspended while the conversion of the jobs to Public Service standards took place. This resulted in 19 vacancies which caused severe service delays, backlogs, and a standstill in in-house R&D. DSIS expected to "drown in a sea of documents." The integration also changed the client base of DSIS. In 1974, 52% of the clientele were CRAD personnel but by the following year, only 35% were

from CRAD. These changes seemed to have a long term effect on DSIS and its operations.

By October 1978, DSIS was staffed with 40 personnel. The "Lapp Report" made recommendations for the reduction of services and a reorganization. Presumably, as a result of that report, the following services and functions were dropped:

a. Work Unit Data System (WUD); a database of ongoing research projects which was part of a data exchange with the U.S.;

b. Keyword out of Context (KWOC); an index produced every two weeks announcing new documents;

c. Information Analysis; a service provided by scientific subject specialists in which they would analyze the current literature and write review papers;

d. Remote searching of the "Retro" database; a contract with I.P. Sharpe in Toronto for remote searching of the database;

e. Information systems research and development; and

f. Staff Studies, which were summaries of on-going research projects distributed to Director-Generals and above on a regular basis, were also cancelled sometime after the Lapp Report was issued.

A reorganization of DSIS, with two sections, was proposed. These would be called Customer Services and Technical Services. The suggested organization was not adopted but a structure similar to the present one, with three sections, was used.

Within the Lapp Report, it was suggested that information specialists could effectively replace defence scientists in information services. With the reduction of the R&D capability and the changing philosophy that information specialists could be an economical means of providing information services, defence scientists who had traditionally been holding information scientist positions were transferred to other staff officer positions. In the 1980s, SIs (Social Science Support Group) and LSs (librarians) were hired to replace them.

By the 1980s, the staffing level had dropped to 34 person years. In 1990, during the National Defence Headquarters Functional Review, the following functions or positions were eliminated: the customer services desk, secretarial support, input clerks, a computer programmer, one information scientist, and the micrographics unit. This resulted in a reduction of 9 person years (PY) and corresponding functions and reduced the strength of DSIS to 25.

The update of the computer system and the proposed change to imaging technology for capturing documents allowed some reductions. The announcement of documents in the form of Document Digests was suspended, although there was some concern about the effect on announcement of Canadian documents to other countries as a result. There was also a reduction in the level of customer service.

In May 1993, subsequent to recent PY reductions and to position itself for the implementation of the salary/wage envelope and possible further cuts, CRAD requested that its support services (including the Defence Research Establishments) be investigated and recommendations be made as to their minimum operational level. This study concentrates on DSIS.

2.2 MANDATE

DSIS receives its mandate from various sources.

2.2.1 Canadian Forces Administrative Orders.

CFAO 57-11 (Annex D) gives DSIS the responsibility of providing R&D scientific and technical (ST) information support to the whole defence community.

2.2.2 Treasury Board Directives.

The Management of Government Information Holdings Directive issued by the Administrative Policy Branch of Treasury Board (1989) (Annex C) describes in detail the government institutions' responsibilities related to information holdings and confirms clearly their obligation to ensure the proper management and widest access of their unique information holdings.

2.2.3 DND recognizes the importance of sound information management.

In May 1993, the offices of the Deputy Minister and the Chief of the Defence Staff produced a draft policy on information management within DND (Annex E). This policy is intended:

"to formalize DND/CF commitment to information management practices and to establish the framework under which corporate direction for the management of Information Holdings and Information Technology is to be formulated and promulgated" and

"to ensure that information is managed as a corporate resource of strategic value in fulfilling the missions and roles assigned to DND/CF".

The Information Management Committee (IMC), chaired by the VCDS, with the Senior ADM/Mat as the Materiel Group's representative, was set up to oversee the implementation of the policy; ADM Fin was designated as the departmental OPI, DGCMS (Director General Corporate Management Services) as the departmental spokesperson for interdepartmental liaison for Information Holdings and CIMS (Chief Information Management Services) and DGCED (Director General Communications Electronics Development) are responsible for information technology.

Although a number of administrative details must still be clarified before the policy is issued, it clearly demonstrates that the Department is conscious of the strategic value of its information holdings and is taking the necessary steps to make more efficient use of it.

2.3 DSIS - ITS SERVICES, STRUCTURE AND OPERATIONS

2.3.1 DSIS Services.

As seen in Chapter 2.1, DSIS has gone through many reorganizations and reductions since its creation in 1947. The

remaining services provided by DSIS are much the same today as they were in 1978. They are as follows:

2.3.2 Collection Management.

2.3.2.1 The Collection.

The DSIS organization collects, catalogues, indexes and manages an important and unique collection of both Canadian and foreign defence-related documents obtained through official exchange agreements with U.S., U.K. and other allied countries, and through many other official and unofficial channels. DSIS has been in existence since the mid-1940's and has collected approximately 1 million scientific and technical reports, many of which are security classified up to secret or have other distribution limitations. Approximately 40% of these documents are available only in rapidly-deteriorating paper; another 40% of the collection is available only in microform, 16-mm cassettes containing several separate documents, microcards, 35-mm roll films, or 105-mm microfiches; the remainder is available both as paper copy and 105-mm microfiche. Because the collection is archival, it grows continually.

At present DSIS holds close to one million titles: 470,000 titles in paper copy, and an additional 450,000 titles in microform (35-mm film, microcards, and the bulk on microfiche).

The DSIS Collection Policy defines the two major components of the collection as follows:

a. **Documents held at DSIS and recorded in the DSIS database (CANDID) or in its predecessor, the card catalogue.** These include Departmental reports and patents deposited with DSIS, limited or classified

reports received from allied nations, and selected reports of other Canadian government departments, universities, or other agencies (Annex F).

The documents added to the collection before 1967 were recorded manually on cards and the analysis of that part of the collection is almost impossible. It is safe to assume that the breakdown between the types of documents is similar to the post-1967 part. The estimated number of this part of the collection is 350,000.

Since 1967, documents added to this part of the collection have been recorded in the automated database and can be relatively easily analyzed.

An analysis of the documents catalogued in CANDID in July 1993 revealed:

Classified:	25050 or 22.24%
Limited:	53802 or 47.75%
Unlimited/ Unclassified:	33820 or 30.01%
for a total of:	112681 documents

b. **Documents held at DSIS but not recorded in the DSIS database.** The majority of documents in this part of the collection are U.S. unlimited/unclassified microfiche documents received through subscription, and commercially published reference books.

There are also miscellaneous older documents of value in storage which are still being evaluated by DSIS staff as time permits.

Ninety nine percent of the collection is kept and archived in a warehouse at

Shirleys Bay at DREO. Only documents acquired during the last three years are kept at DSIS.

DSIS LSs and SIs keep a close eye on the clients' needs, research activities and Department goals to ensure the pertinence of the collection. Much effort is devoted to expanding the collection and completing gaps through ongoing literature and external databases monitoring.

2.3.2.2 Distribution and Lending.

"DSIS acts as the sole distribution agency for scientific and technical reports which originate in Defence Research Establishments across the country. It also supplies, on loan, documents from any source which are in the DSIS collection, subject to security regulations. Microfiche or hard copies of such documents are supplied on request for retention by the users.

DSIS is responsible for the distribution of Canadian, defence-related documents and microfiches not only to individuals and organizations in Canada but to the United States, the United Kingdom and some Commonwealth and NATO countries." (Lapp Report)

Annually, the Document Delivery and Collection Organization Section (DSIS-3) sends approximately 42,000 copies of documents (50% hard copies/50% microfiche) to customers. Of these, 39% are forwarded as part of the initial distribution of documents. Very few documents are loaned (317 in 1992).

The distribution statistics for 1992 indicate that these documents were sent to:

Canadian

Other DND	28,000	66.6%
CRAD and DREs	9,500	22.8%
Universities	2,200	5.2%
Other Government	1,200	2.9%
Industry	1,000	2.5%
	42,000	100.0%

Foreign

U.S.	186
U.K.	155
Australia	132
France	9
Netherlands	75
New Zealand	61
Shape Technical Centre	18
	636

All documents sent to foreign countries are processed through the appropriate foreign liaison office or embassy and the official distribution agency, eg., Defense Technical Information Center (DTIC) in the U.S. or Defence Research Information Centre (DRIC) in the U.K. DSIS keeps records of all initial and subsequent distributions of a document.

The average turn-around time for a document from the DSIS collection from when it is received to when the copy is sent is two to three days for an unclassified document and one week for a classified one.

2.3.2.3 Origin of Distributed Documents.

In 1992, the documents distributed by DSIS were of the following origin:

Canadian Documents		*16,000	40%
U.S. ADA	5,000		
U.S. Others	13,000	18,000	42%
AGARD		4,500	10%
Other Foreign (U.K., Abstracts, TTCP, NAMRAD, CBDE, SACLANT, STC, Journals, Naval Science, Underwater Acoustics)		3,000	7%
CRAD Brochure, misc., etc		500	1%
		42,000	100%

* Origin of Canadian Documents

UNCL/CLAS	DREA	DREO	DREP	DRES	DREV	DCIEM	AGARD	CRC	OTHER	TOTAL
UNCLASS.	1,309	3,346	280	1,288	1,764	239	3,713	349	1291	13,649
CLASSIFIED	79	1,107	100	148	361	0	231	0	314	2,340
TOTAL	1,388	4,453	380	1,436	2,125	239	3,944	349	1605	15,989

2.3.2.4 Document Requests By and From DSIS.

- By DSIS: In 1992, DSIS requested 1768 documents from other countries to satisfy specific requirements identified by customers through their SDI or other means. Of these requests, 1184 were filled, 274 were refused and the others are pending. DSIS is also responsible for making the proper follow-up and for informing customers on the status of their requests.

REQUESTED BY DSIS FROM:	NO. OF REQUESTS	RECEIVED	REFUSED
AUSTRALIA	4	0	0
BELGIUM	55	6	0
CANADA			
DND	26	8	0
OTHER	5	4	0
FRANCE	38	4	0
GERMANY	33	11	0
NETHERLANDS	55	7	0
SWEDEN	4	0	0
U.K.	325	146	15
U.S.	1205	998	259
NATO	18	0	0
TOTAL	1,768	1,184	274

- During the same period, 636 requests for documents were received from other countries:

186	from U.S.
155	from U.K.
132	from Australia
9	from France
75	from Netherlands
61	from New Zealand
18	from STC
636	

2.3.2.5 Collection Announcement.

DSIS announces new additions to its collection in three ways: SDI, CD-ROM and exchange of tapes. It provides Australia and the U.K. with updated tapes of its collection regularly. Until the demise of the Document Digests, other foreign defence agencies received announcements of new documents in that format. The CD-ROM product is sent to the DRE libraries every three months.

2.3.3 Selective Dissemination of Information (SDI)

"The SDI Service provided by DSIS is available to individuals in the Department of National Defence (including the CRAD Establishments and military colleges) and in certain industries and universities where defence contracts are performed. It is a computer-based current-awareness service which is tailored to individual requirements. It provides information about scientific and technical research reports on a selective basis in specialized subject areas. The primary goal of the SDI service is to alert clients to the existence of recently published information that matches their interest profiles."

"Once a client's interest profile has been prepared or updated, it may be matched or run in the DSIS computer against any one or all of the tapes or databases, and this selection of databases may be updated at any time by changing the specific codes which indicate the database to be searched. Each time a tape is received from the database producer, the interest profiles indicated to be run against that database are matched, and all references or document records that meet the specifications or search parameters in the interest profiles are selected, sorted by client number of identification, printed on separate sheets, and mailed to clients." (Lapp Report, 1978)

The DSIS/SDI Service includes searches of the DSIS database updates, the U.S. Department of Defense database (TAB tapes - known as Special SDI), and the DRIC tape from the U.K.

Listings are produced and mailed monthly for the Canadian SDI, bi-monthly for the American SDI and twice a year for the British.

Profiles are established by the DSIS information scientists (LSs and ISs) through interviews with customers, either at the beginning or during the conduct of projects. Upon request, those profiles are reviewed annually through meetings and discussions with customers and outdated profiles are removed from the database.

Between 1978 and 1992, the numbers of SDI customers doubled. In 1992, approximately 1235 customers (Annex G), versus 539 in 1978, were using the SDI service. Of these, 410 (31%) are from the CRAD organization, that is:

CLIENT	No. of Clients		No. of Profiles		No. of Hits	
	1978	1992	1978	1992	1978	1992
Experimental Profiles	29	107	44	204	518	3571
Defence Research Establishment						
DCIEM	44	32	85	69	842	724
DREA	43	59	97	146	1325	883
DREO	45	60	88	136	427	974
DREP	28	45	54	102	665	724
DRES	26	62	43	139	201	1124
DREV	54	111	91	214	923	2012
TOTAL (DRE's)	240	369	458	806	4383	6441
DSIS Internal	-	5	13	5	293	46
Government Depts	15	23	24	40	275	416
NDHQ	120	323	202	596	3136	5817
Universities	8	12	12	20	84	113
Industry	14	29	53	59	629	467
Canadian Forces Bases *	113	367	226	733	3714	6359
GRAND TOTAL	539	1235	1032	2463	13032	23230

* For 1992, includes colleges, test establishments, etc.

It is difficult to compare "Number of hits" because we do not know how many records were on the 1978 source tape.

2.3.4 Literature Searches

Although DSIS provides some of the DND libraries with copies of its bibliographic database on CD-ROM and in microfiche format, most individual customers neither have access to it, nor possess the equipment to access it. Neither do they have access to commercial databases.

Between August and December 1992, DSIS staff made 864 literature searches for customers. 225 were performed on the CANDID (DSIS) database, 201 on the U.S. defence database (DROLS) and 438 on commercial databases through CAN/OLE, DIALOG, or other database vendors. Annex H lists those customers and the number of searches requested by each of them.

2.4 DSIS, ITS COSTS COMPARED TO ALLIED NATIONS

COUNTRY	CANADA $	FOREIGN CURRENCY
CANADA		
- Staff 25		
- Salaries	850,000	
- Operational	250,000	
- Capital	500,000	
TOTAL	1,600,000	
FRANCE		
- Staff 220		
- Salaries	9,600,000	40,000,000FR
- Operational	{ 15,360,000	{64,000,000FR
- Capital	{ ---	{ ---
TOTAL	24,960,000	104,000,000
GERMANY		
- Staff 108		
- Salaries	4,524,000	DM 5,800,000
- Operational	1,341,600	DM 1,720,000
- Capital	569,400	DM 730,000
TOTAL	6,435,000	DM 8,250,000

NETHERLANDS		
- Staff 29		
- Salaries	1,350,000	-
- Operational	962,000	-
- Capital	320,000	-
TOTAL	2,632,000	
PORTUGAL		
- Staff 7		
- Salaries	130,000	-
- Operational	34,000	-
- Capital	15,000	-
TOTAL	179,000	-
UNITED KINGDOM		
- Staff 57	1,624,000	& 820,000
- Salaries	733,000	& 370,000
- Operational	119,000	& 60,000
- Capital	2,476,000	& 1,250,000
TOTAL	4,952,000	2,500,000
USA		
- Staff 383		
- Salaries	19,821,610	US$15,131,000
- Operational	29,561,460	US$22,566,000
- Capital	3,098,150	US$ 2,365,000
TOTAL	52,481,220	US$40,620,000
STC		
- Staff 11		
- Salaries	640,000	NGL 960,000
- Operational	203,400	NGL 305,000
- Capital	18,700	NGL 28,000
TOTAL	862,100	NGL 1,293,080

2.5 DSIS ORGANIZATIONAL STRUCTURE.

Beside the Director and Administrative Assistant, DSIS is composed of three major sections, namely: Information Services (DSIS 2), Document Delivery and Collection Organization (DSIS 3) and Technical Services and Systems (DSIS 4).

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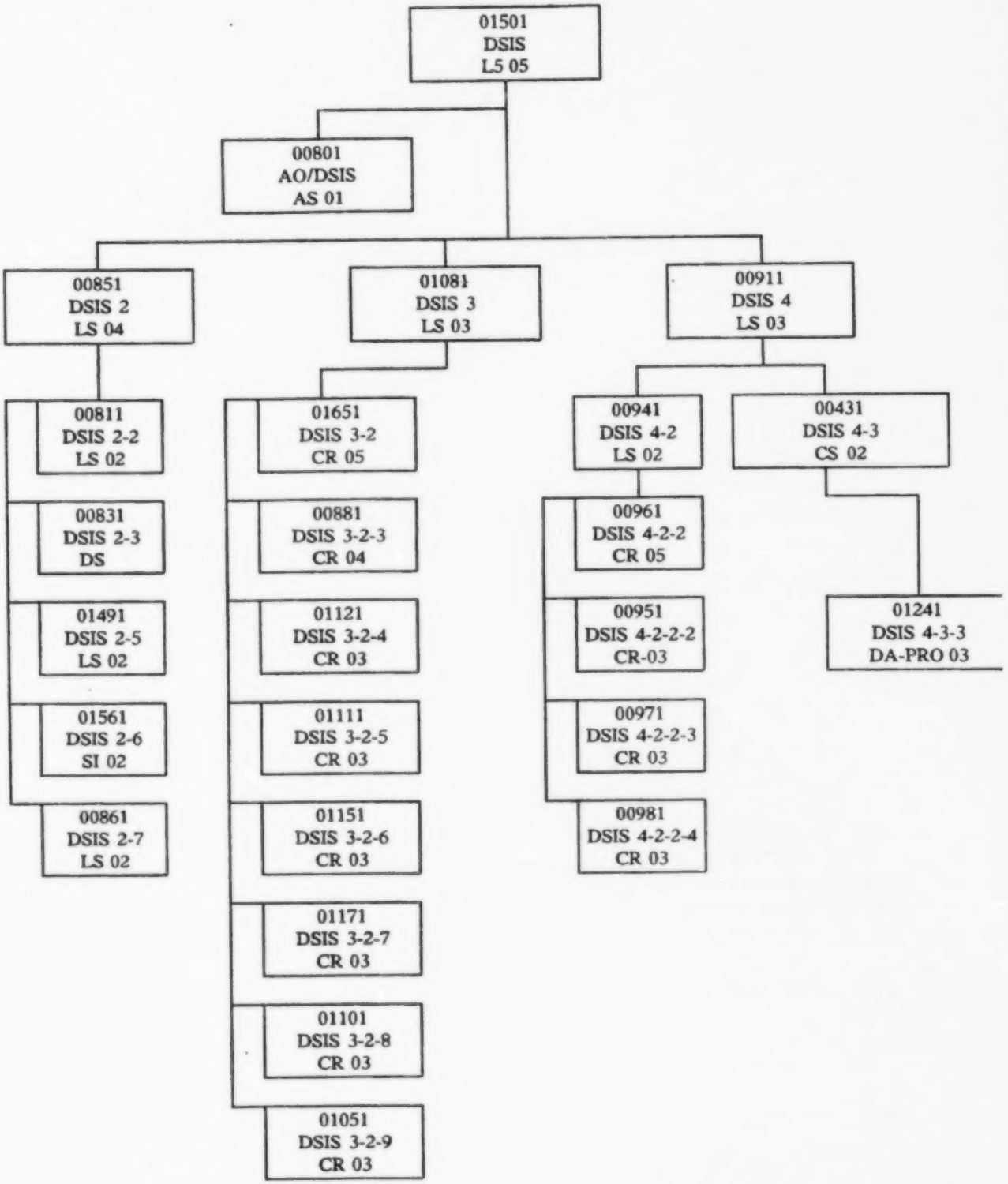
DIRECTOR SCIENTIFIC INFORMATION SERVICES



2.6 DSIS ACTIVITIES.

DSIS has an establishment of 25 positions, 2 of which are the Director's and Administrative Assistant's positions.

DSIS 2 - The Information Services Section is composed of 4 librarians, one information specialist and one defence scientist. It manages the SDI service among other things. Through discussions with customers, DSIS 2 staff establish, review and update patrons information requirements and profiles of interest to be run against DSIS, DTIC and DRIC new acquisition tapes.

This section is also responsible for indexing all documents added to the DSIS collection. This responsibility implies that the content is reviewed and analyzed so as to identify and enter the main subjects, subject index terms and the abstract for each document in the DSIS database. Since the same personnel is involved in both the SDI profile definition and the document indexing, the latter gains in accuracy.

This section also does the bibliographic searching. At the beginning of a project, or for specific requirements during the course of a project, customers turn to DSIS to make a thorough search of literature published in their fields of interest. Whereas SDI listings keep customers aware of new publications available, searches of the CANDID database will provide them with a complete inventory of documents published on the subject. Since many DND and CF customers do not have access to DSIS facilities nor have the required hardware to access the DSIS CD-ROM, U.S. DROLS CD-ROM, or specialized and publicly available commercial databases through CAN/OLE, DIALOG, or other vendors, DSIS staff perform these searches. In the recent years, this service has been used in many instances in response to ministerial inquiries or information requests through the Access to Information Act.

Finally, this section is also responsible for the definition, update, and implementation of the Collection Development Policy. Through its daily and frequent contacts with customers, knowledge of their requirements and of the departmental goals, DSIS-2 staff must ensure that gaps in the collection are filled and that the collection is expanded accordingly.

DSIS 3 - The Document Delivery and Collection Organization Section is comprised of eight clerks supervised by a librarian who are responsible for the physical management of the DSIS collection. Upon acquisition, all documents are filmed, reproduced on microfiche and stored. DSIS 3 is responsible for the distribution of all DSIS products, including SDI printouts.

DSIS 3 also manages a collection of "ADA" (U.S. unclassified, unlimited documents) microfiche which are automatically received on distribution from DTIC. Annually, DSIS-3 reproduces and distributes the microfiche version of the DSIS database to the DRE libraries and other customers.

DSIS 3 staff also does the initial distribution of all DND, AGARD and other accessioned documents, subsequent to the approval of the Director of Security (D Secur), if necessary.

As soon as requests are received for documents, DSIS-3 personnel analyses them and forward to D Secur, if necessary, to ensure that there are no security concerns which would preclude the release. They also seek the approval of a third party if required; subsequently hard copies or microfiches are produced and mailed. In a few instances, documents are loaned. In all cases, DSIS-3 keeps records of all distributed and loaned documents.

DSIS 4 - The Technical Services and Systems Section is divided into two subsections. One, supervised by an LS-02 and composed of four clerks, is responsible for the descriptive cataloguing of acquired documents and for the inputting of abstracts in the local database. Personnel must also ensure that the catalogue data is updated regularly and that the corporate source file remains accurate so as to maximize the access to the collection. Finally, it supervises the production by a contractor of the CD-ROM version of the DSIS database.

The other subsection, which includes a computer specialist and a DA-PRO, has the mandate of developing and maintaining the DSIS VAX 4000 Computer, peripherals, software and programs. It also supports the 18 PC users, a local area network, a tempest network and runs the SDI program. This group also arranges for tapes to be sent to a contractor for the production of a microfiche catalogue.

2.7 DSIS OPERATIONS (related activities by section)

DSIS 2	DSIS 4	DSIS 3
I - COLLECTION MANAGEMENT		
• Collection Development Policy		
· analyzes departmental goals, activities, strategic planning		
· monitors DND/CF/customers activities		
· identifies collection requirements, gaps		
· performs literature searches to orient collection and fillgaps		
· analyzes documents (go to documents acquisition process)		
• Documents Acquisition (requested and not requested, hardcopies/ micro forms) from DTIC, DRIC, NATO, NAMRAD, AGARD, DREs, other sources:		. documentation tracking and receipt.
· vetting according to Collection Development Policy	· descriptive cataloguing - data input abstract	· filming and production of microfiches
. preparing need-to-know statements		
· indexing of documents to be accessioned - data input	· authority control	· filing of originals/ microfiches (including ADAs)

DSIS 2	DSIS 4	DSIS 3
		· initial distribution as approved by D Secur · distribution as recommended by DSIS upon receipt · archives at Shirleys Bay after 3 years
• Documents requests processing and distribution		
		· check approved distribution (green sheet) · check with D Secur (upon request) · check with third parties (if necessary) to expand distribution · retrieve fiche or documents · produce copies of microfiche · send copies following regulations · loan documents and keep track · keep records of distributions
• DSIS Collection Announcement		
	· update tape on collection	· send DSIS collection index CD ROMs or tapes to internal/ external customers

DSIS 2	DSIS 4	DSIS 3
	· production of CD ROMs by contractor	· com fiche, microfiche distribution
		· distribute microfiche to internal/external customers
II - RETROSPECTIVE SEARCHING		
· search restricted databases (DSIS, DROLS, etc.) and identify documents of interest		· order documents from sources or clearing houses
· search commercial databases		· make a follow-up on orders
· provide a listing to requester		· if unique document, goes through document acquisition process
· help completing "need to know" statement if applicable		

DSIS-2 DSIS-4 DSIS-3

III - SELECTIVE DISSEMINATION OF INFORMATION

- SDIs production

  - analyzes customers requirements
  - production of profiles
  - update of profiles

- maintain and run SDIs program and DSIS and other countries tapes
- production of micro-fiches masters
- systems backups
- systems maintenance
- systems development and improvement
- (CANDIS Imaging)
- support of PC Network
- support of Tempest network

PART II: ANALYSIS AND RECOMMENDATIONS

3.0 SHOULD DSIS BE DISSOLVED?

Based on the information given in Part I and obtained from existing studies, a literature survey and interviews with the DSIS staff, customers and partners, Part II assesses the DSIS mandate and services in terms of necessity and usefulness for the Department as well as for customers. It also identifies possible improvements and alternatives to the actual situation and studies their feasibility, taking into account security, operations and constraints arising from existing agreements. Recommendations are based on historical, legal, and economic considerations.

3.1 INTRINSIC VALUE OF INFORMATION

DSIS is involved solely in the information business. Its value is equivalent to that of the information it collects plus the use of this information for the customers. Let us see first the intrinsic value of information.

In "Les nouveaux pouvoirs," (Toffler: 1991) best-selling author, Alvin Toffler, makes a thorough analysis of the world evolution and comes to the conclusion that the knowledge (information) and the ability to process and use it (information technology) will constitute the main source of power in the coming century.

> *"Des trois sources fondamentales d'autorité sociale, c'est le savoir, parce qu'il est le plus adaptable, qui donne «le maximum de "bang" au dollar», comme disent volontiers les hauts galonnés au Pentagone. Il sert aussi bien à punir qu'à récompenser, convaincre et même transformer, il peut faire de l'ennemi un allié; et surtout le savoir adéquat permet de reconnaître et contourner dès l'abord les mauvaises situations, évitant par là le gaspillage de la force ou de la richesse. Le savoir est encore un multiplicateur de la richesse et de la force. Il peut servir à accroître les ressources de ce côté, ou, à l'inverse, à en dépenser moins pour atteindre un but déterminé. Dans les deux cas, l'efficacité s'en trouve accrue; quelle que soit la fin de la partie, on y aura risqué moins de "jetons" de pouvoir..."*

"... Voici peu de temps encore, la puissance militaire n'était fondamentalement qu'une amplification de la force brute du poing. Aujourd'hui, elle dépend presque totalement de l'«intelligence congelée» - autrement dit du savoir incorporé dans les armes et dans la technologie des moyens de renseignement..."

"Le savoir s'avère donc être non seulement la source du pouvoir de la plus haute qualité, mais aussi le plus important facteur de la force et de la richesse."

The ever increasing strategic value of information gives more weight to the Treasury Board directives, to CFAO 57-11 and to the recent DND initiatives to better manage its information holdings.

3.2 UNIQUENESS OF THE ORGANIZATION, ITS MANDATE AND ITS COLLECTION

DSIS is the sole organization responsible for the management of all Canadian Defence STI. It has been so since the 1940s and the information thus acquired is also either unique (DND origin), could only be obtained through official international agreements or simply, could not be requested twice by the same country. Should DSIS (or any other organization that would be responsible to fill the same mandate) disappear, DND and CRAD would have to face the following consequences:

- loss of free access to ADAs resulting in additional expenses of approximately $500K/year throughout the department,
- increased delays in the processing of information requests and more denials due to lack of coordination and additional burden caused to other countries,
- loss of access to important documentation for the many DND organizations that only have DSIS to rely upon to obtain documents,
- loss of control over millions of dollars worth of Canadian Defense-related documents published every year,
- loss of profitability obtained in giving the above-mentioned documents the widest distribution,

- overlap in R&D contracts and projects, loss of knowledge and know-how,
- loss of our ability to obtain information from other nations in exchange of ours,
- loss of credibility among allied nations due to our inability to centrally control and protect classified and sensitive information,
- loss of support to CRAD HQ and establishments whose costs and delays to obtain information would drastically increase, and
- loss of central professional support and control of DRE library services.

3.3 RETURNS ON INVESTMENTS

3.3.1 Increased Productivity and Effectiveness of Scientists.

DSIS proves to be not only necessary because of the uniqueness of its mandate and the information it collects, but also for its contribution to the resulting increased productivity of its customers.

Annex I is a list of customers met during the course of this study and a summary of the discussions. In most cases, comments are much the same as those of the Lapp study in 1978. Mainly, scientists and managers say that the SDI and literature search services keep them aware of the research that is being or has been done elsewhere in their field of interest thus avoiding duplication of effort, saving the scarce resources necessary to complete a project and identifying sources of information or possible corporate help. Although some scientists and managers have access to foreign information through exchange programs such as AGARD, NATO, various memoranda of understanding (MOU), or TTCP, many of them can only rely on DSIS or commercial services.It's timeliness is also important because defence-related information is often available in document form as early as 18 months before it appears in the open literature.

Many customers, who are defence scientists, engineers or managers, confirmed that if they were not provided with this

readily available information, they would either not make the efforts to obtain it, and hence a loss of knowledge, competitiveness, delays and waste of resources, or spend expensive time, energy and money searching databases often limited to commercially available information.

CRAD personnel account for approximately 30% of DSIS customers and is by far the best supported staff in terms of professional library services. Because of their location or limited means, most of other DSIS customers would have no other sources to turn to access the required information.

Scientific and technical information requirements are not unique to Canada and nobody can express them better than scientists themselves. In a lecture given to the U.S. Defense Technical Information Center (the U.S. equivalent of DSIS) in December 1991, Forrest R. Frank (Frank: 1991), a scientist working for the U.S. Institute for Defense Analyses describes the importance of DTIC services. His text as reported here expresses exactly the feedback obtained from DSIS customers during interviews. He states:

> *"Current awareness products are very important to me. They help me save time and money because it is far less expensive use of my time to read a DTIC product than it is to attempt to search DTIC and other databases myself. They help me avoid costs I would otherwise incur if I attempted to use other information sources to keep track of what research DoD is reporting in fields of interest to me. Some of the current awareness products I receive tell me a good deal about the approach others have taken, thereby saving me from unnecessary duplication of effort."*

Much like its Canadian counterpart, the SDI service allows him to know:

- who is active in the field (contacts),
- the state-of-the-art,
- what technical approaches others are taking,
- what relevant data is available,

- how he can avoid repeating experiments done by others, and
- how necessary the proposed tasking is.

About data, Frank goes on to say *"... anything a scientist or engineer can do to collect data without having to run off to a laboratory saves time, saves money, saves effort ... as taxpayers we want to encourage experimentation for the generation of new scientific and technical information. We want scientists and engineers working on problems of interest to DoD to first check with DTIC to gain whatever data is appropriate, thereby maximizing the amount of new data that must be collected".*

About technical approaches and analyses made elsewhere he says: *"... knowing how others have already analyzed a given problem is critical to the progress of scientific knowledge."*

About the dollar value of ST Information, Frank says:

"Oftentimes it is possible to calculate the dollar value of scientific and technical information. Some of these savings can be calculated directly.

Savings can be characterized as either direct or indirect. In some instances, it costs users less to come to DTIC for help than it costs to seek answers to questions themselves or from alternative information sources. For example, the costs of a computerized search of the DTIC technical reports database is substantially less than the cost of having a scholar spend his or her time physically inspecting the DTIC holdings looking for reports on a particular topic.

... In other instances, use of scientific and technical information obviates the need to conduct expensive, time-consuming experiments. The costs of extracting data in an appropriate manner from existing reports are almost always far less expensive than re-creating a set of experiments to obtain the same information from experimental results."

3.3.2 Increased Productivity and Effectiveness of Managers.

Information is also the basis on which managers responsible for materiel acquisition must support their decisions so as to make the best use of DND dollars. Frank says:

> *"DTIC information can be especially helpful in program planning and program coordination. The WUIS [Work Unit Information System - abandoned by DSIS following the Lapp Study] in its current or its enhanced mode can plan a vital role in helping DoD better manage its limited RDT&E [Research and Development, Technical and Engineering] resources. It can facilitate the sharing of information, of scarce R&D facilities, and improve the utilization of RDT&E resources. DTIC information can be used to develop and implement test and evaluation plans that are more effective in identifying the strengths and weaknesses of system performance.*
>
> *Finally, DTIC information can be used to facilitate improvements in standardization of DoD systems, subsystems, and components. Use of the IR&D [the equivalent of the DSIS database] database as well as other DTIC information can also be used to identify urgent solutions to technical problems related to system performance, maintenance, or operational use.*
>
> *To the extent that managers of technical staffs are given access to DTIC products directly, they often obtain the same benefits that their bench level scientists and engineers obtain as noted above. The more challenging question is how do managers benefit because their staffs use DTIC?*
>
> *Current awareness products help managers by allowing their staffs to track developments in a field at relatively low cost. Multiple current awareness products consumed by an organization facilitate and support staff specialization, helping to ensure that staff members don't duplicate each others' work. Current awareness products help managers retain their focus on issues of importance to DoD. Current awareness products allow staff and managers an opportunity to coordinate their research activities with*

those of others publishing or reporting in the field or disciplines of interest.

Report bibliographies are of benefit to managers because it costs substantially less in both dollars and time to have DTIC prepare such documents than it does to assign research staff to prepare bibliographies. Furthermore, use of DTIC to prepare bibliographies allows research staff to spend time on multiple tasks.

Managers benefit from their staff's use of existing reports in several ways. Review of existing reports by research staff helps to assure managers that experiments will not be repeated unnecessarily. Even if it is necessary to repeat an experiment described in scientific literature, managers and researchers can better understand the data generated by an experiment and its analysis should seek to fill the gap in knowledge. To the extent that existing reports obviate the need to conduct experiments to generate data, managers have more resources that can be applied to new problems for which experimentation is the only manner by which data can be generated. Use of existing reports helps focus efforts on those problems or parts of problems that are new, relevant, and not yet addressed in the literature. Finally, use of existing reports helps keep researchers and their managers from avoiding mistakes made in the past. Some of those mistakes may be procedural, others may have been analytical. In either event, knowledge of the past can be most beneficial in avoiding scientific errors in future work."

This increased productivity of scientists as well as of managers will inevitably accelerate the pace DND gets new or improved systems into the hands of soldiers, sailors and aircrew.

3.3.3 International Ethical and Security Considerations.

By acquiring its collection of unique defence-related documents, managing it according to international security and library standards, announcing it to allied countries and making it widely available, under certain guidelines (Annex J), Canada and its scientists and engineers obtain recognition on an

international forum and are given equal access to invaluable and almost unlimited scientific and technical information. Countries such as U.S.(DTIC), U.K. (DRIC), France (CEDOCAR), Germany (DOKFIZBN), the Netherlands (TDCK), Portugal, Turkey, and major organizations such as NASA and SHAPE, are all members of the "Heads of Defence Information Centres Group" currently being chaired by DSIS. Each country has a central organization similar to DSIS for the control of defence STI.

This information exchange, however, is done on a "give and take" basis and implies that we play by the same rules as the other participants, i.e., protect their information and limit requests through channelling them via one central focus point.

In 1978, the Lapp report also supported the same idea but for security reasons:

> *"Finally, because a significant portion of the incoming, stored and outgoing documents are security classified, the service provides necessary control mechanisms as required under the Official Secrets Act, and also satisfies the requirements for handling classified documents from our allies. The existence of a central Canadian facility for receiving and handling classified documents helps to assure the continuing receipt of this vital material from abroad."*

Every time a classified or limited document is obtained through DSIS, it is accessioned and microfiche is produced to ensure that any second request for the same document does not have to be processed by DTIC. In these circumstances, it is also much easier for DSIS to verify that Canadian requesters do have the appropriate need to know and security clearance.

RECOMMENDATION 1: THE COMMITTEE REAFFIRMS THE PARAMOUNT VALUE OF THE DSIS ROLE AND RECOMMENDS THAT IT BE KEPT INTACT.

4.0 CAN DSIS SERVICES BE REDUCED?

In Chapter 3.0, we have seen the intrinsic value of information and the uniqueness, necessity and profitability of DSIS. The second question that must be raised is: **"Can its services be reduced**

further or, are its objectives realistic within the actual reduction context?"

The many reviews and reductions undergone by DSIS since its integration in 1974 have already led to the transfer of a few services to other DND organizations and to the reduction of important services. (Chapter 2.1)

To these important reductions, DSIS added salary savings by progressively replacing its defence scientists with personnel in the LS and SI groups.

Some of the cuts may have saved resources for CRAD but probably proved to be very expensive for the Department. The Work Unit Data System (WUD) contained data of ongoing research projects and was part of a data exchange with the U.S. The Lapp report considered that it contained the same information as the CRAD database (RDPIS) and recommended its abandonment. Similar databases are kept by DTIC and DRIC and, in the U.S., it is largely used for planning purposes at all managerial levels in the Pentagon (Frank: 1991). Another database contained data on staff studies conducted and being conducted within the Department. Which experienced manager of the Department is not aware of the duplication of projects (e.g. actual investigation of C^2 systems) and staff studies within DND and of the tens and even hundreds thousands of dollars and resources so wasted?

The remaining services constitute the bare minimum necessary to manage a unique collection of documents and to make it accessible and profitable through SDI and loan services, and through its announcement in DND and allied countries. Hence, what would be the sense of collecting documents if not given the widest access? All DSIS activities are oriented towards that single goal and cannot be cut without rendering useless the whole existence of DSIS.

Frank's comments about DTIC could apply to DSIS:

> *"DTIC is probably one of a handful of organizations in the Department of Defense that in fact is going to see growth, notwithstanding that big 25 percent reduction. Why? Because the only way everyone else can do their job with fewer resources is to take advantage of the one resource DTIC has. There is only*

one resource in the world which increases in value every time it is consumed--information. The more it's used, the greater it becomes in value. As a user of DoD's scientific and technical information base, it is my view that DTIC's future, unlike almost all other components in the Department of Defense, is very encouraging."

RECOMMENDATION 2: THE COMMITTEE RECOMMENDS THAT NO FURTHER CUTS BE MADE TO THE SERVICES PROVIDED BY DSIS.

5.0 CAN DSIS PROVIDE THE SAME SERVICES WITH FEWER HUMAN RESOURCES?

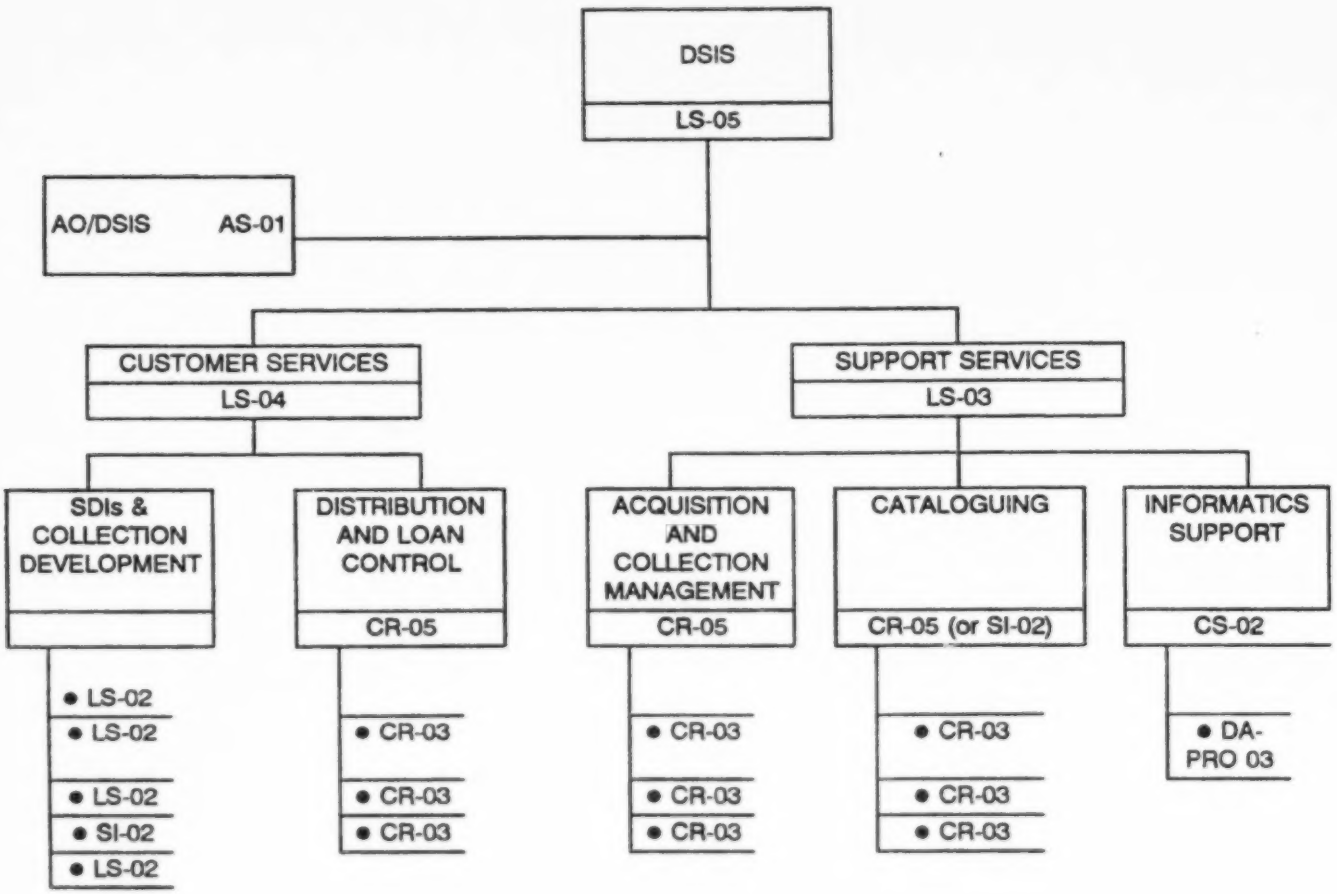
The question that must be answered is "Can DSIS provide the same services and meet the same objectives more efficiently and economically with fewer human resources?"

An ideal target - At first glance, when compared with other CRAD organizations, DSIS may seem "fat" and appears as a ideal target when PY reductions have to be implemented because DSIS accounts for 24% of the CRAD Headquarters establishment. Moreover, DSIS is not a CRAD service but a DND Service. A cut in DSIS would affect more seriously the rest of DND and there again, DSIS appears to be the right target. However, when looking back into history and considering what is being done in allied countries, one must be careful not to seriously handicap such a profitable, unique and necessary organization. Since 1974, DSIS has lost 70% of its human resources. In terms of PYs, its information holdings management represents 6.5% of that of the U.S., 43% of U.K., 25% of Germany and is even lower than that of the Netherlands. Moreover, despite important reductions of their armed forces (25% in U.S.), none of these countries have or intend to reduce this service. Turkey, Portugal and Greece are in the process of establishing information centres with the assistance of AGARD.

Canada/DSIS	25 PYs ($850k) + 700k =	$1.5M
U.S./DTIC	383 PYs ($15M US) + 25M US =	$40.0M US
U.K./DRIC	57 PYs ($1.6M) + 850k =	$2.5M
Netherlands	29 PYs ($1.3M) + 1.3M =	$2.6M
Germany	108 PYs ($4.5M) + 1.9M =	$6.4M
France	220 PYs ($9.6M) + 15,3M =	$24.9M

Reductions - But, is DSIS doing its business in the most efficient way? Through a detailed study of the organization, its structure and activities the Committee was impressed by the efforts and the imagination used to cope with successive reductions and maintain the quality of services at its current level. Further very minor personnel reductions could only be obtained through a reorganization of the structure to reduce the supervision layers in DSIS-4 Section (once recommended by the Lapp report). The DSIS organizational structure corresponds to the larger organization that it was years ago and must be rethought in view of reducing the levels of supervision. In DSIS-4, an LS-03 supervises an LS-02 who supervises a CR-05 who supervises three CR-03s. Regrouping customer services in one section (DSIS-2 staff) and technical support services in another could be a viable solution. This may be a mid-term and very delicate solution due to the very high quality of the supervisors in place who would all be valuable to the organization. Care must be taken however, not to cut the lower-level support positions that are "over-supervised". Should the decision be to reorganize DSIS but to keep the so freed positions, CRAD should consider resuming the staff studies database. This process must include the acquisition and use of new equipment and technology to allow customers to have a direct access to a few services, and at the same time, reduce the burden at DSIS.

POSSIBLE ORGANIZATIONAL STRUCTURE



NOTE: This organizational chart is presented with much reserve since human factors, collective agreements, resource limitations, and other internal considerations unknown to the Committee must be taken into account. Two positions could be cut.

RECOMMENDATION 3: THE COMMITTEE RECOMMENDS THAT THE PERSON YEAR REDUCTIONS BE LIMITED TO 2 AND THAT THEY BE MADE SUBSEQUENT TO AN IMMEDIATE STRUCTURAL REORGANIZATION THAT WOULD REDUCE THE SUPERVISION LAYERS.

The Committee also suggests that an efficient communications plan and channel be established not only within DSIS, but also between DSIS staff and CRAD Headquarters. Although very cooperative during our interviews, the DSIS staff proved to be incredibly unaware of the overall CRAD situation in terms of reductions and expressed a deep concern about their job security and the future of DSIS.

6.0 COULD DSIS OPERATIONS BE IMPROVED?

Following the Lapp study in 1978 and to compensate for its resources reductions, DSIS brought many improvements to its facilities and operations throughout the years. Some of these were:

- important reduction of the turnaround time necessary to accession a document ordered by a customer and received from a foreign source;
- publicity of DSIS services;
- more regular updates of the SDI profiles;
- the acquisition of a better microfiche printer;
- production and distribution of the CD-ROM database to the DREs; and
- use of a LAN to facilitate the data input in indexing and cataloguing.

During interviews with both the staff members and customers of DSIS, some more suggestions on how the services should or could be enhanced arose. Customers, who appreciate the services provided by DSIS, are becoming more sophisticated in their information needs and in the use of technology to access information. They are looking to DSIS to provide services which fit their own evolving requirements.

The following recommendations for expansion or changes to

services are suggestions for DSIS to consider. It is expected that DSIS would have to perform an examination of the details of any of the recommendations to determine feasibility.

It is recommended that:

a. The production and distribution of the CD-ROM database be expanded.

   Presently, DSIS produces 8 copies of the unclassified portion of the DSIS database (including references since 1969) for limited distribution to DRE libraries. The format of the database is very useful and it would be useful to a broader client group. Specifically, it is suggested that:

   i the distribution of the CD-ROM be expanded to all DND libraries and major client groups,

   ii the frequency of the production of the CD-ROM be increased to make it more current,

   iii the coverage be expanded to include unclassified references to classified documents,

   iv there be two versions, classified and unclassified, and

   v the equipment for producing the CD-ROM product be purchased so that these recommendations may be carried out in-house and the costs of production reduced. An additional benefit would be that the technology could be used for the creation of other products. The known costs are $7700 for the 8 copies produced commercially and $114K for the purchasing cost of the equipment.

b. Imaging technology be incorporated for the reproduction of documents.

   Consistently, customers state the disadvantages of microfiche. The ease of reproduction, storage and distribution does not compensate for the inconvenience associated with its use. Customers often have limited or no access to microfiche readers, less often to reader-printers and do not have a source for getting "blowbacks", i.e., hard copies. They find the quality

of the microfiche to be inconsistent and occasionally impossible to read.

To tackle the microfiche problem, DSIS has already explored a shift from micrographics to optical technology for the storage and distribution of documents. This will provide customers with a more readable product. It is recommended that the acquisition of the scanner and laser printer for this shift be accelerated.

c. Planning and preparations for electronic documents be initiated.

The expectation of being able to receive documents electronically is increasing in the information user group. CRAD, as a producer of scientific information should also consider its role in electronic publishing. The advantages of this type of distribution include cost effectiveness, timeliness and quality of the copy.

The DREnet is the medium which would support this function. For this to occur, however, it would have to be enhanced to handle high speed data transfer, as planned. It is recommended that DSIS positions itself to take advantage of the enhancement.

d. The DREnet and other DND networks be used to provide services.

DSIS could make effective use of the DREnet by offering customers the following:

i access to an unclassified version of the database for those users without access to the CD-ROM, or in lieu of the CD-ROM database,

ii the distribution of the SDI,

iii on-line access to the thesaurus and ability to modify their own SDI profiles on-line, and

iv the ability to order documents on-line.

e. The Establishments acquire the DROLS database on CD-ROM.

The U.S. Defense Technical Information Center produces their database on a CD-ROM and has made it available to DSIS and some of the Establishments for approximately $600 U.S. per copy. If all of the DREs were to obtain a subscription, the responsibility for searching of the database could be shifted to the Establishments. This would reduce some of the workload for DSIS. Although there would be some increases in cost and in responsibility for searching in the Establishments, it would offer more direct access to the database. Scientific staff would be able to access the database themselves, if they so chose.

f. The cataloguing procedures be reviewed.

DSIS uses a long record format for the cataloguing and indexing of documents entered into the database. It follows accepted international defence information practices. DSIS may wish to evaluate the number of fields and index terms to determine whether a change in procedure would reduce their workload without decreasing the integrity of the database.

g. DSIS become a permanent member of the Information Management Committee and of the Information Holdings Steering Group.

Because of the uniqueness and importance of its mandate, DSIS should be a member (at least attend all meetings) of the Information Management Committee. Moreover, DSIS should be a permanent member of the Information Holding Steering Group. Actually, ADM(Mat) is represented by Dominique Charles from MGIS who is involved in the technical aspect of the information systems only.

h. A video on DSIS services be produced for inclusion in the ADM(Mat) orientation course and presented on a regular basis to current and potential customers.

The Lapp report and the actual study clearly revealed a deficiency in the publicizing of the DSIS services within DND. As mentioned earlier, most of DSIS resources are used to maintain the actual infrastructure and manage the collection. For the same reasons that a reduction of the customers would not result in important resource savings, an increase would not require more resources but would contribute largely to the

profitability of the collection. A video on DSIS services should be produced, presented on a regular basis to DND customers included in the ADM(Mat) orientation course and made available to all libraries throughout the Department.

RECOMMENDATION 4: THE COMMITTEE RECOMMENDS THAT THE FOLLOWING IMPROVEMENTS BE STUDIED BY DSIS AND IMPLEMENTED WITHOUT UNDUE DELAYS:

a. **Expansion of the use and distribution of the CD-ROM version of the DSIS database and the acquisition of the equipment to produce it;**

b. **Acquisition of computerized imaging equipment for the reproduction of documents;**

c. **Use of electronic documents as soon as the DREnet permits;**

d. **Use of DREnet and other DND networks in support of basic activities such as external access to DSIS database, SDI profiles and SDI distribution, and document ordering;**

e. **Acquisition of the U.S. DTIC CD-ROM by the DRE libraries;**

f. **A review of cataloguing procedures;**

g. **A request that DSIS becomes a permanent member of the Information Management Committee, and of the Information Holdings Steering Group; and**

h. **The production of a video on DSIS services to be included in the ADM(Mat) orientation course and presented on a regular basis to current and potential customers.**

7.0 OTHER ALTERNATIVES

Through our discussions, questions were raised and suggestions were made as to the possible alternatives to the actual reduction problem. When looked at in detail, however, the feasibility of further reduction is not that evident.

7.1 SHOULD DSIS LIMIT ITS SERVICES TO CRAD CUSTOMERS ONLY?

- **Doing so would be contrary to the actual directives and administrative orders**. In the same way as CRAD is responsible for supporting the whole Department and the CF with its R&D expertise, one of its components, DSIS, must provide the same community with its unique defence-related information holdings management services. This is an official mandate formalized in the CFAOs and supported by the TB directives. Government institutions must give the widest access to their unique information holdings.

- **Although it would allow CRAD to realize minor savings, it would be incredibly costly for DND and the country**. Many of the DND/CF staff have no other access to information services. Hence, the same basic structure, services (collection management, loan, acquisition, distribution, announcement, micrographics, archiving, SDIs, and facilities) would have to be maintained. Only the number of transactions would be reduced thus resulting in possible minor PY cuts in a few services (SDIs, loan and distribution). What would be the sense of investing important resources in building and managing a unique collection of documents and then limiting its access? Based on the returns on investments identified in Chapter 3.2, on the fact that CRAD represents only 30% of DSIS customers, and because the same basic structure would have to be maintained, this alternative would prove to be very costly.

Over and above this consideration, DND would still need a central focus point for the processing and management of information sent to and obtained from allied countries. Mandating another organization to fill this gap would necessitate the duplication of the DSIS structure with the resulting waste of resources.

- **Limiting access to DSIS services would automatically reduce the scope of its collection**, since an important part of it originates from outside CRAD and DND. This would deprive DND of a number of unique and expensive documents and invaluable information. It is easy to understand that collection users are those who are interested in investing in it and make the appropriate efforts to give access to the information obtained through personnel or other official and unofficial channels. As repeated so often, this information may be worth millions.

- **This alternative could also be costly for CRAD itself**. Since its creation in 1947, DSIS has always been servicing the whole defence community and has been funded accordingly. Should CRAD decide to implement this alternative, the risk is high that its budget be cut by much more than the potential savings.

RECOMMENDATION 5: THE COMMITTEE RECOMMENDS THAT DSIS CONTINUE TO PROVIDE SERVICES TO THE WHOLE DND COMMUNITY AND NOT LIMIT THEM TO CRAD.

7.2 WOULD A DECENTRALIZED COLLECTION AMONG THE DREs BE A VIABLE SOLUTION?

- First, for reasons already known, this alternative would only be possible if CRAD decided to limit DSIS services to its organization, which is not recommended.

- A decentralized collection would not eliminate the requirements for an SDI service, nor for the central management of the collection to ensure standards are followed and that information technology is adequate and progresses according to the requirements. It would multiply the archiving problem by six since all DREs actually use DSIS for that purpose, and as noted earlier, it would limit the collection to DRE acquisitions, which would represent an important reduction of the collection.

- This alternative would not allow DND to meet the TB directives and would result in the creation of a parallel service elsewhere in the Department.

- This alternative would result in a very heavy additional burden for CDLS and DRE staff. Other countries would still request that documents be processed through a central focus point. At present, all incoming U.S. documents are forwarded to DSIS through CDLS for further accessionning, microfilming and distribution. Should DSIS be taken out of the loop, CDLS(W) would have to do the detailed distribution of these thousands of documents. Central organizations in other allied countries would have to send documents in many copies to Canada. Moreover, the DREs would have to access all these documents, microfilms and announce them, and make the distribution and loans for which they would require new equipment and additional personnel.

- However, the DRE libraries should be able to input into the DSIS database. The scientific staff in the Establishments often acquire documents through exchanges and meetings but are hesitant to deposit them with DSIS. If a system was set in place whereby Establishment libraries could contribute to the database the cataloguing record for these items, it might help to overcome the concern about being deprived of documents. The DSIS record would have to contain a location field for the Establishment and the Establishment might be responsible for copying the document to fill requests.

Such a proposal would have to examine the impact on the workload at the DREs.

RECOMMENDATION 6: THE COMMITTEE RECOMMENDS THAT A DECENTRALIZED COLLECTION AMONG DREs BE CONSIDERED AS A POSSIBLE IMPROVEMENT TO WIDEN THE DSIS COLLECTION BUT NOT AS A SOLUTION TO THE ACTUAL RESOURCES REDUCTION PROBLEM.

7.3 SHOULD DSIS IMPLEMENT A COST-RECOVERY SYSTEM?

The answer to this question is not simple and depends much on where the person who answers sits.

It is obvious to the Committee that this alternative is technicaliy and administratively feasible.

In fact, the Health and Welfare Health Protection Branch Library has been doing this for 7 or 8 years. At the beginning of each fiscal year,

the 5 directorates transfer funds to this central library based on estimates obtained from previous usage. Once a month, statistics compiled by the libraries are analyzed by an administrative assistant who establishes the costs (it uses approximately 1/4 PY). In the middle of the fiscal year, adjustments are made according to the services rendered; more funds are transferred or some are returned to the customer directorate.

This system is used for interlibrary loans, on-line searching, SDI and photocopying. There is no charge for loaning books or journals or for ordering books. A flat rate of $50 is charged for most on-line searching and the full fee for larger searches.

Should there be a problem with the quality of the services provided by DSIS, the implementation of a cost-recovery would be the right solution since the organization would have to adjust to customers' requirements to survive. But according to our interviews and the recent customers survey, this is not the situation. The same rationale would apply to tackle a lack of efficiency in the organization, which again, is not the case. Through the numerous cuts and reviews, DSIS organizational structure and services have been brought down to a bare minimum (except for the minor possibilities of reduction identified) thus forcing it to be most efficient and creative in the provision of services.

For many reasons, it is most probable that a cost-recovery system would significantly reduce the number of customers and transactions, thus limiting the access to the collection (which would be contrary to TB directives). For those hundreds of users who do not have access to a budget or would have to struggle through heavy administrative procedures and red tape to obtain the necessary funds, this would be seen as an almost impossible time-wasting mission. Despite the recognized value of information and its direct and proved incidence on the productivity of managers and scientists, most DSIS customers are not of the type that would struggle to leave their laboratory or office to obtain the information (see interviews). Scientists no longer have the luxury of time to do extensive first hand bibliographic research. This means that, in addition to the increased administrative burden necessary to manage it, the cost-recovery system would lower by much the profitability of the unique DSIS collection.

About DTIC customers, Frank declared:

"Some users of scientific and technical information have questions so urgent and so important to the business of defense that holding information until payment is made defeats the purpose of having the information in the first place. DTIC may in fact have thousands of users whose questions are so important or whose resources are so limited that it makes no sense to try to charge on a per service basis."

The savings would be equivalent to those obtained in limiting access to the collection to CRAD's customers, and would be outweighed by the administrative costs of the system, resulting burden, delays and by a much reduced profitability of the unique DSIS collection in terms of scientists' and managers' effectiveness.

As mentioned at the beginning of this chapter, the resulting "apparent" reduction in DSIS activities could be seen as a valuable solution for a manager outside the CRAD organization whose only objective would be to cut resources. But, CRAD has all the reason to believe in the value of DSIS services, as other countries do. It must avoid putting itself in a trap where minor visible savings, almost outweighed by additional administrative burden, would result in expense duplication of research and loss of the productivity of highly-paid specialists.

Within the same Department, when resources are scarce, one must resist the tendency to embark on a vicious circle of increasing controls and administrative systems to protect the existing resources, thus reducing the resources used to provide the services themselves.

The implementation of a cost-recovery system would most probably demonstrate that DSIS services are more expensive than those available from public counterparts which would badly and wrongly affect the reputation of DSIS and the opinion of other DND organizations and customers. The reasons behind it were well-expressed by Frank and apply to DSIS:

"One of the things that differentiates DTIC from Dialog or other commercial information vendors is the fact that DTIC works with a very interesting set of data. It is data that not just anybody can have. It's restricted, controlled, or classified. Many times the data is restricted and controlled and classified. The limitations on the

distribution (and sales) of DTIC information imposed by the information security regime in which DoD operates may be one of the reasons why DTIC proves unable to meet cost-recovery goals set by the Comptroller."

Unless forced to do so, CRAD should not invest resources that will only contribute to increase the administrative burden, reduce the number of customers and result in loss of the productivity of scientists and managers and costly duplication of work. Such a system could contribute to the improvement of services and efficiency of an organization; but DSIS is already an efficient organization.

Such systems could have been implemented in the 1980s when organizations could afford to invest more resources to obtain more resources. In the 1990s, we have to do less "with less". The DSIS services being already at their minimum, the "with less" here could mean further minor cuts as suggested earlier, but certainly not expanded and heavier administrative procedures. Thought should be given, however to charging fees to contractors and customers from other Departments, and universities. Those charges could be the same as CISTI's for equivalent services.

RECOMMENDATION 7: THE COMMITTEE DOES NOT RECOMMEND THE IMPLEMENTATION OF A COST-RECOVERY SYSTEM EXCEPT FOR CONTRACTORS AND PUBLIC CUSTOMERS, ACCORDING TO THE PROVISIONS OF CFP-B-GS-055-000/AG-001.

7.4 SHOULD DSIS OPERATIONS BE TRANSFERRED TO THE CANADA INSTITUTE FOR SCIENTIFIC AND TECHNICAL INFORMATION (CISTI) AT THE NATIONAL RESEARCH COUNCIL?

The last alternative that was considered by the Committee was the "transfer" of the whole DSIS organization and services to the Canada Institute for Scientific and Technical Information of the National Research Council. The services offered by CISTI are similar to those provided by DSIS with the difference that they are available to the public and limited to commercially available information and documents.

To study this feasibility, the Committee met with Mr. Bernard Dumouchel, CISTI's Director for Resource Development. Through the discussions, this alternative appeared possible and CISTI showed a

very strong interest in the project. In line with its new strategic thrusts, CISTI was already considering it with another Department and had developed a methodology to evaluate the costs, feasibility and profitability of such transfers. Should this project be pursued, and with NRC being a federal government institution, the organization would be transferred as a whole, as is the case for any lateral transfers. Personnel layoff would be avoided.

NRC personnel being absent for the summer period, the Committee agreed to postpone the study of this alternative until September and to use the NRC method to that effect. The NRC proposal is attached as Annex K.

Without anticipating the eventual results of this study with NRC, the Committee foresees some drawbacks which could result from a transfer and recommends that they be seriously weighed in the decision process.

First, the security aspect will have to be considered. A non-DND but governmental organization would be managing and controlling DND classified and protected information. How D Secur would relate to this type of relationship is unclear? Could one of their security officers be detached in permanence with CISTI to ensure the proper follow up, the obedience of security regulations and to give the authorization required for the release of classified and protected documents?

How would allied countries departments of defence (eg., U.S., U.K., and others) accept this transfer of responsibility to a non-defence agency? In both cases MOUs would have to be renegotiated and approved.

As stated in the TB directives, Departments and other government institutions are responsible for the sound management of their information holdings. Transferring this responsibility to CISTI would require TB approval as it is a deviation from the actual directives.

With DND being the largest department of the Canadian Government, this feasibility must be very seriously studied as it may have a domino effect on all other government departments. It is obvious to us that the DSIS transfer would be used by CISTI as a reference and a tool to grab other government departments information holdings management agencies.

Even if the study established the feasibility and financial profitability of such a transfer for CRAD and DND. This would mean that the biggest Department would not have the real control over its information holdings and on the resources it sees reasonable to invest in their management. Mid-term effects could also prove to be not as profitable or even very costly as DND would depend on an organization on which it has no control whatsoever for the provision of these services. Should CISTI make costly mistakes, modify its priorities, orientations, or should it decide unilaterally to increase prices, DND will have no other option but to accept it.

This transfer could also seriously affect the value of the collection. DND personnel (including DREs) are already reluctant to deposit their documents with their own organization. How would it be with CISTI?

Another important aspect to consider is the knowledge and interest of the DSIS staff. They belong to DND and serve DND personnel. They know the Department, the goals, the orientations, learn about their customers which not only helps them to be more efficient but which also adds to their motivation and interest. How would it be if they were from another government institution? How will it be once they disappear with their knowledge? How will CISTI keep up with the changes and corporate knowledge of DND? Forest said:

> *"There's an old aphorism that comes out of bureaucratic politics that "where you stand on an issue often depends on where you sit." If a user sits at a laboratory bench, one kind of information product or service may be very important; if a user sits behind an LSD (a large steel desk)..., other information products or services may be at a premium. Understanding the different information requirements of various categories of users may help DTIC better gauge the variety of information that should continue to be collected, analyzed, and disseminated."*

Finally, as mentioned earlier in creating the Information Management Committee chaired by the VCDS and in producing a draft policy on the subject, DND has demonstrated its interest. The Committee strongly suggests that the feasibility of transferring DSIS to NRC be brought up to the attention of this committee, if considered seriously, as it would affect the whole Department and not only CRAD.

RECOMMENDATION 8: THE COMMITTEE RECOMMENDS THAT A JOINT COMMITTEE BE SET UP AS SOON AS POSSIBLE TO STUDY THE TRANSFER OF DSIS TO THE NATIONAL RESEARCH COUNCIL. THE STUDY WOULD USE THE NRC METHODOLOGY AND TAKE INTO ACCOUNT THE POSSIBLE DRAWBACKS MENTIONED IN THE REPORT. IT IS ALSO RECOMMENDED THAT THE SUBJECT BE BROUGHT UP TO THE INFORMATION MANAGEMENT COMMITTEE PRIOR TO TAKING ANY DECISION AND THAT ALL OTHER RECOMMENDATIONS BE ACTIONED WITHOUT AWAITING THE RESULTS OF THE NRC STUDY.

7.5 COULD DSIS DEAL DIRECTLY WITH DTIC?

According to interviews conducted at DSIS, there is a redundancy in some of the tasks done in CDLS(W) and in their own organization, eg., the follow-up on requests. DSIS could do without CDLS (W) as it has been doing without CDLS(L) during the past year. The Department of External Affairs would have to be consulted to that effect.

RECOMMENDATION 9: THE COMMITTEE RECOMMENDS THAT IMMEDIATE STEPS BE TAKEN TO ELIMINATE THE CDLS(W) INVOLVEMENT IN THE PROCESSING OF DOCUMENTS AND REQUESTS SENT TO OR RECEIVED FROM DTIC. ONLY THE MAIL FUNCTION SHOULD BE KEPT.

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TITLE:(U) THE DEFENCE SCIENTIFIC INFORMATION SERVICES ITS FUTURE DIRECTION

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ABSTRACT: (U) In May 1993, Associate CRAD created an ad-hoc committee to produce recommendations on the future of the Directorate of Defence Scientific Information Services (DSIS). The Committee first gathered data on the organization through interviews with the DSIS staff and customers, analyzed existing studies and surveys, scrutinized services and activities, scanned the organization's history and searched the literature to learn more about the situation in allied countries. The Committee also contacted a representative from Health and Welfare Canada to discuss cost-recovery systems and a representative from the Canada Institute for Scientific and Technical Information (CISTI) at the National Research Council to look into the possibility of transferring DSIS to that organization. Part I of this report details that research. Subsequently, the Committee analyzed the data and drew recommendations as responses to the specific questions that had to be answered about the DSIS mandate. The analysis and recommendations are reported in Part II.

DESCRIPTORS: (U) Information services;Documents;Information centers;Research management;data bases;Document announcement;Assessments;Cost estimates;Human resources;Document storage;Management planning

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